DOCUMENT RESUME

ED 220 747 CG 016 152

AUTHOR Talbot, Gilles L.
TITLE The Effects of Student Meanings of Work on Their Self-Concept and Intrinsic Motivation and Subsequent Academic Performance.
INSTITUTION Champlain Regional Coll., Sainte Foy (Quebec).
SPONS AGENCY Ministry of Education, Quebec (Canada).
REPORT NO ISBN-2-551-04319-0
PUB DATE 81
NOTE 83p.; Project supported by a grant from the Direction generale de l'enseignement collegial within their "Programme de subvention a l'innovation pedagogique." Figures 1-4 and Appendices 3-7 not filmed due to marginal legibility. For related document, see CG 016 153.

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Academic Achievement; Dropout Research; Educational Objectives; Foreign Countries; Interest Inventories; *Relevance (Education); *Self Concept; Student Attitudes; Student Interests; *Student Motivation; *Student Teacher Relationship; Two Year Colleges; *Two Year College Students
IDENTIFIERS *Canada

ABSTRACT

There is a strong popular belief that self-concept and motivation are intricately related to performance. To test this theory, a study was conducted to determine if increases in student self-enhancement and intrinsic motivation would explain increased academic performance. Students (N=472) in experimental groups completed interest inventories, which were then used by professors to prepare classes based on what students felt was meaningful. The results revealed that increasing the professor's awareness of how students perceived the meaningfulness of his/her discipline and then applying this knowledge to course preparation directly enhanced students' intrinsic motivation and directly influenced students' self-enhancement, two factors which were found to be significantly related to academic performance. (Author/JAC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED220747

99-8010

The Effects of Student Meanings of Work on Their Self-Concept and Intrinsic Motivation and Subsequent Academic Performance.

BY

Gilles L. Talbot

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Gilles L. Talbot

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

St-Lawrence Campus
Champlain Regional College
Ste-Foy, P.Q. G1V 4K2

Programme de Subvention à l'Innovation Pédagogique
Direction Générale de l'Enseignement Collégial

CG 016152

Dépôt légal —— Deuxième trimestre, 1981

BIBLIOTHEQUE NATIONALE DU QUEBEC

Code for DGEC: 99- 8010

ISBN: 2 - 551 - 04319 - 0

Cover artwork by Kenny King, Class of '81

This research project was made possible thanks to a grant from the "Direction générale de l'enseignement collégial" within their "Programme de subvention à l'innovation pédagogique."

One may obtain additional copies of this report by forwarding your name and address plus $8.00 (to cover postage, handling,and photocopying and binding charges) to:

Gilles L. Talbot
St-Lawrence Campus
Champlain Regional College
790, Nérée Tremblay Street
Ste-Foy, P.Q.
G1V 4K2

Tel.: (418) 656-6921 (extension 55)

Figures 1 - 4 and Appendices 3 - 7 available from author.

THE EFFECTS OF STUDENT MEANINGS OF WORK ON THEIR SELF CONCEPT AND INTRINSIC MOTIVATION AND SUBSEQUENT ACADEMIC PERFORMANCE.

BY

GILLES L. TALBOT
CHAMPLAIN REGIONAL COLLEGE
ST-LAWRENCE CAMPUS
STE-FOY, P.Q.
G1V 4K2

Table of Contents

Dedication..... I.

Acknowledgments..... II.

List of Figures and Tables..... III

Introduction..... 1

Review of the Literature

Introduction..... 7

Methodological Considerations..... 8

The Measurement of Self-Concept and Motivation. 13

Pertinent Research..... 17

Methodology

Hypotheses..... 26

Evaluation Instruments..... 28

Design..... 28

Subjects..... 29

Stimuli..... 30

Procedures..... 30

Analysis of Data..... 31

Conclusions..... 61

Appendices

Note on the CCMI and the MWS..... 63

1-Directions given to students at mid-semester... 64

2-Directions given to students at the end of the semester..... 65

3-Interpreting the MWS scores and calculations of the rank-orders per class of student MWS.... 66

4-Data on the Mid-semester and End of semester grades for students by category, by teacher and by group..... 67
5-Data on the scores of the Community College Motivation Inventory (CCMI) for students at mid-semester and end of semester..... 69
6-Data on Final Grades for students who passed or failed by category and by teacher..... 79
7-Data on Mid-semester grades for students who passed or failed by category and by teacher..... 80
References..... 81

Dedication

This work is dedicated to the teachers who participated in this project, to the students who made it possible, and to the faculty and administrators of St-Lawrence who supported it.

Also, I should like to dedicate it to the persons who add meaningfulness to my life: My Mother, Marianne; my wife Louise; and my son Sebastien.

ACKNOWLEDGMENTS

I would like to take this opportunity to express my gratitude for time, effort and cooperation to Mr. Robert Gagné, Campus Academic Dean; Mr. J. Edward Murphy, Campus Director; Mr. Arthur Potter III, Pedagogical Officer of the College, and to Mr. Jean-Marie Bergman, College Director.

The author is especially indebted to Dr. Harry Caughren, Jr. and to Dr. H.C. Kazanas for allowing me to use the Community College Motivation Inventory (CCMI) and the Meaning and Value of Work Scale (MVWS), respectively.

Mr. Dale Ward, former Librarian at our Campus, Mrs. Louise Petryk, current librarian, Mrs. Dorothy O'Brien of the Library staff have willingly assumed the tasks of helping to chase down references. Their moral support and cooperation are greatly appreciated.

The heart-warming reception and collaboration of the teachers who participated in this project surpasses my ability to put it into words. To them my heartfelt "Thanks." Specifically, these people are Mr. Ed. Desbiens, Mrs. Mary Robertson, Mr. Peter Jacobs, Mr. Réné Moisan, Mr. Lorne Coughlin, Mr. Bob Donnelly, Mrs. Ann Qualman, Mr. Rolly Lemire, Mr. Pierre Zubrzycki, Mr. Guy Mercier, Mrs. Georgia Goth, Mr. Walt Kasowski, Mr. Jan Warnke, Mr. Chris Vandenberg, and Mr. R. John Miller. A very special thank you is extended to Mr. Mike Kelley, who patiently listened and then programmed the data for analyses. His collaboration and friendship throughout this project have contributed to my intrinsic motivation and augmented my faith in people.

The author wishes to express his personal appreciation to the Committee members of the DGEC Subventions à l'Innovation Pédagogique, for generously supporting this project, and for demonstrating an active interest in the development of the student as a person.

Figure 1-A: Abandon (ABD) and Failure (F) percentages for Champlain Regional College - St-Lawrence Campus from January, 1976 through May, 1979. 2.

Figure 1: Scattergram of student scores on intrinsic motivation with final grades. 36.

Figure 2: Scattergram of student scores on self-enhancement with final grades. 36.

Figure 3: Scattergram of student scores on person orientation with final grades. 37.

Figure 4: Scattergram of student scores on goal deficiency with final grades. 37.

Figure 5: Pearson Product Moment Correlation Coefficients between student scores on the subscales of the CCMI and their final grades. 38.

Table 1: The Kruskal-Wallis one-way analysis of variance for class averages at mid-semester for students in the full-control, half-control or experimental classes. 40.

Table 2: The Wilcoxon Matched-Pairs Signed-Ranks of class averages for the students in the Full-Control group between mid-semster and end of semester. 41.

Table 3: The Wilcoxon Matched-Pairs Signed-Ranks of class averages for the students in the Half-Control group between mid-semester and end of semester. 42.

Table 4: Wilcoxon Matched-Pairs Signed-Ranks of class averages for the students in the Experimental group between mid-semester and end of semester. 43.

Table 5: The Wilcoxon Matched-Pairs Signed-Ranks of total Community College Motivation Inventory (CCMI) scores for the students in the Half-Control group between mid-semester and end of semester 44.

Table 6: The Wilcoxon Matched-Pairs Signed-Ranks of the Self-Enhancement scores for the students in the Half-Control group between mid-semester and end of semester. 45.

Table 7: The Wilcoxon Matched-Pairs Signed-Ranks of the Intrinsic Motivation scores for the students in the Half-Control group between mid-semester and end of semester. 46.

Table 8: The Wilcoxon Matched-Pairs Signed-Ranks of the Person Orientation scores for the students in the Half-Control group between mid-semester and end of semester. 47.

Table 9: The Wilcoxon Matched-Pairs Signed-Ranks of the Goal Deficiency scores for the students in the Half-Control group between mid-semester and end of semester. 48.

Table 10: The Wilcoxon Matched-Pairs Signed-Ranks of total Community College Motivation Inventory (CCMI) scores for the students in the Experimental group between mid-semester and end of semester. 49.

Table 11: The Wilcoxon Matched-Pairs Signed-Ranks of the Self-Enhancement scores for the students in the Experimental group between mid-semester and end of semester. 50.

Table 12: The Wilcoxon Matched-Pairs Signed-Ranks of the Intrinsic Motivation scores for the students in the Experimental group between mid-semester and end of semester. 51.

Table 13: The Wilcoxon Matched-Pairs Signed-Ranks of the Person Orientation scores for the students in the Experimental group between mid-semester and end of semester. 52.

Table 14: The Wilcoxon Matched-Pairs Signed-Ranks of the Goal Deficiency scores for the students in the Experimental group between mid-semester and end of semester. 53.

Table 15: The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students failing in the experimental, half-control or full-control classes at mid-semester. 54.

Table 16: The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students passing in the experimental, half-control or full-control classes at mid-semester. 55.

Table 17: The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students failing in the experimental, half-control or full-control classes at the end of the semester. 56.

Table 18: The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students passing in the experimental, half-control or full-control classes at the end of the semester. 57.

Table 19: The Wilcoxon Matched-Pairs Signed-Ranks of numbers of students per teacher between mid-semester and end of term for students failing at the end of the semester in the Half-Control group (Category 2). 58.

Table 20: The Wilcoxon Matched-Pairs Signed-Ranks of numbers of students per teacher between mid-semester and end of term for students failing at the end of the semester in the Experimental group (Category 1) 59.

Table 21: Data for the analysis of variance with three-way classification: student averages for high- and low-Intrinsic Motivation scores for two types of Goal Deficiency under two levels of Self-Enhancement. 59.

Table 22: Analysis of variance, 3-way classification, fixed effects model for the data of Table 21. 60.

INTRODUCTION

In compiling the descriptive statistics for students failing courses in psychology, we noticed that these data were not available on a departmental, collegiate, or Cegep-wide basis. A routine check with the Québec Department of Education revealed that none had expressed a need for descriptive statistics of students failing (Duval, 1979). In so doing, we have been neglecting a source of valuable information that may shed light on wasted human potential. According to the Québec Department of Education (1978) it costs approximately $340.00 per student for each failure. Consequently, several million dollars are also wasted each year when too many students fail to avail themselves of the opportunity of a Cegep education.

Of the nearly 660 students currently enrolled in our Cegep we can expect, based on the normal probability curve, that approximately 16 students would fail due to inadequate intellectual capability. A study at our campus revealed that there was a sizeable number of students who were failing —— nearly 35% ! (See Figure 1-A,page2) It seems improbable for such failures to have resulted solely from the intellectual incapacity of students.

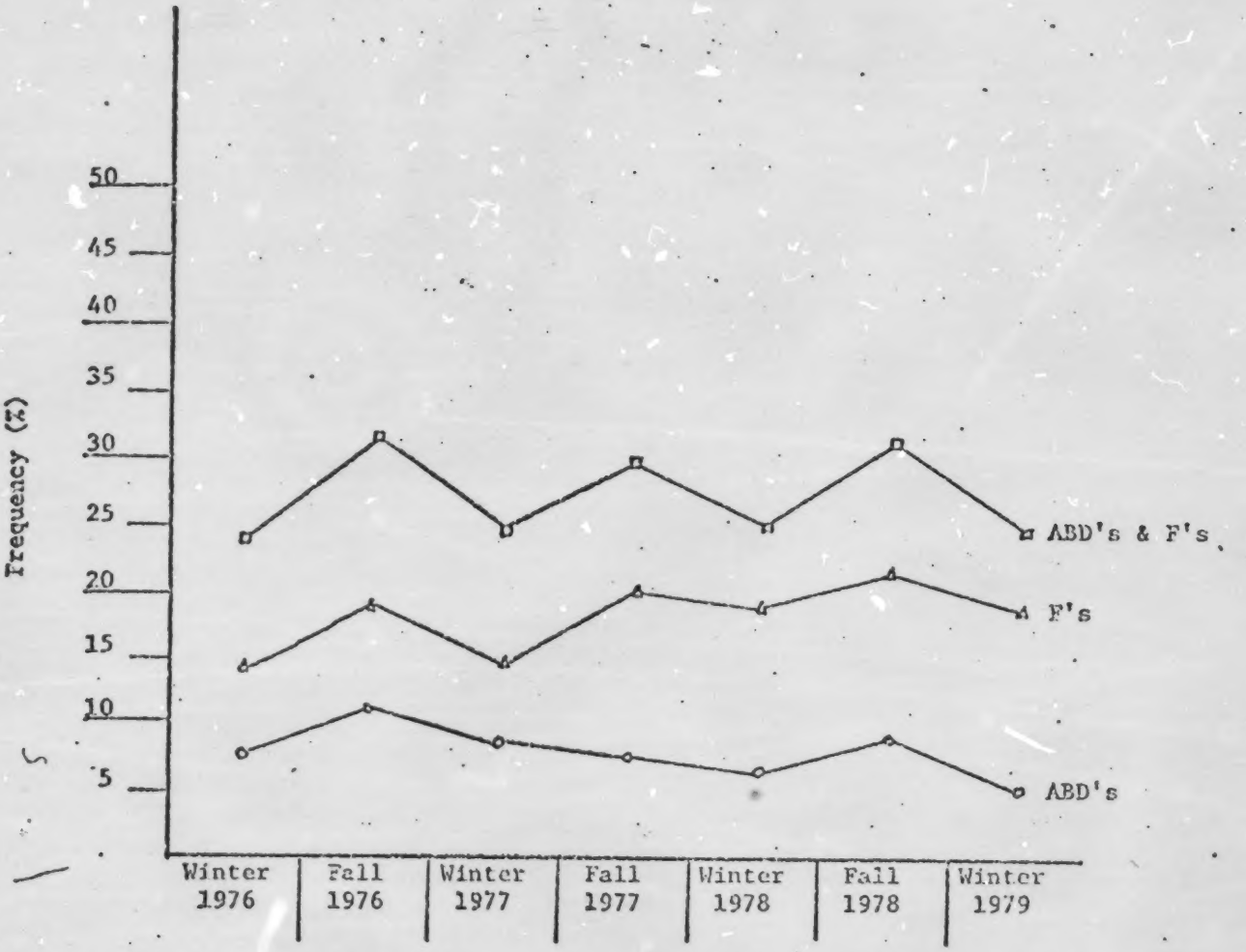
Other than the intellectual incapacity of students to explain these failures, one might also consider the following reasons:

—— the student's lack of preparation while in high school

—— the financial obligations and commitments incurred by students to attend Cegep

—— the growing societal bias against manual labor

FIGURE 1-A



Abandon (ABD) and Failure (F) percentages for Champlain Regional College - St. Lawrence Campus from January,1976 through May, 1979.

- the bias for intellectual skills by parents, college administrators, teachers, counselors and even students
- the lack of motivation
- the lack of pride and dignity in assuming the role of "student" or the absence of shame and guilt for failing
- the inability of students to discover meaningfulness or relevance in the pursuit of their studies beyond the initial parental and peer group pressures to attend Cegep.
- the student's values are not in keeping with his abilities.

The easiest defense to explain such high failure rates is to blame the secondary schools for not adequately preparing students for Cegep studies. This displacement of responsibility is unacceptable because high school diplomas are awarded to students on the basis of results on standardized examinations that are prepared, administered and scored by the representatives of the Minister of Education of Québec. This obviously contributes to a coherent and stabilizing influence on the quality of the Secondary V leaving certificate. Furthermore, the certificate is required, in all but exceptional cases, for admission to Cegep. Additionally, students are admitted to Cegep programs after successfully demonstrating their ability in a variety of courses deemed relevant to their intended program of studies. Evidently students who are failing in Cegep were passing in high school and established that they have ability by successfully competing on provincial achievement examinations. Therefore, we cannot accept that secondary schools are not doing their job.

The argument for student incurred expenses to attend Cegep is also untenable. The Québec Department of Education awards each year numerous scholarships, loans and bursaries to students who are in financial need. Apparently, the most serious reason for not receiving at least a loan is that the student is wholly dependent on a parent with a relatively large income. Finally, there is no tuition and most equipment is available on a rent-free basis. Financial worries then do not appear as a major source contributing to an explanation for student failures.

As the industrial revolution settled in Canada it became apparent, as elsewhere, that mass production was the cornerstone of our political, economic and social growth. As the technological skills grew in number and complexity, and diversified into all facets of work, the demand for manual labor declined. The age of automation and electronic wizzardry grew with the space-age of the sixties. It can be safely said that Canadian society today is much more in need for people with a "good head on their shoulders" rather than with those "with a strong back." In addition to the demands made by industrialization the parents, teachers and counselors have biases for intellectual skills. The bias for intellectual ability is derived largely from expectations for increased socio-economic status which leads too many students to undertake studies that they are not prepared or capable to pursue. The work ethic of Canadian society appears to have metamaphorsed from physical labor to intellectual prowess. This ethic is one of the principles behind the open door policy of the community college or cegep movement. Students then stand to gain from starting at the top of the ladder and working their way dow- to a level that suits their abilities and interests. However, college admission committees and officers attempt to predict

the success of students in programs before admitting them. Prediction that is based, for the most part, on the type and quality of performances in past courses, and sometimes in potential as revealed in psychological testing and interviews. It doesn't appear that the high rate of failures in the cegeps is due to having students admitted to programs for which they are not being prepared.

"Lack of motivation" is another trite phrase. There are those who believe that such an attribution actually describes the student. The underlying assumption is that more motivation would remedy the problem. We are reminded by the Yerkes-Dodson Law of the fallacy of such reasoning. The optimal level of performance is based upon moderate levels of motivation. The psychology of individual differences testifies convincingly that such moderate levels of motivation are personal and normally distributed. To argue that "more" motivation is needed for students to succeed is like arguing that bringing water to the desert will make the land fertile. When the student's capabilities are inadequate or when his goals for attending cegep are not clearly formulated, the assumption of adding "more motivation" becomes meaningless.

In Japanese college and universities, for example, students affirm with pride and dignity their student role. Students appear as motivated to seek approval or success and to avoid disapproval or failure. The consequences of this neurotic dichotomy are expressed in the substantial number of students who commit suicide for failing out of college. Some observers of our Cegep students would argue that those who fail manifest little pride and dignity by allowing themselves to fail. These persons believe that *at least* such students ought to feel ashamed and guilty for failing. We could of course

create sufficient anxiogenic situations, as occur in Japanese educational institutions, to make students proud for succeeding and sufficiently ashamed for failing. Without going to the extreme of suicide, the burden of anxiety and guilt that such observers would have students suffer is untenable socially and psychologically.

Parental expectations are present and operative at the moment of their child's birth. These expectations serve to guide, to influence and even to coerce the child into, amongst other things, studying. When the child is old enough to identify the influence from parental expectations, the peer group is already subtlely operative. Consequently, we have students attending Cegep who sometimes fail because they have for too long allowed their parents to make their decisions. Still other students, who eventually fail were simply following their group of friends. That is, they were responding to peer group pressure to also attend Cegep. In both cases the student who clearly lacks the ability has fallen victim to the Peter Principle. That is, he continues to attend school until he reaches his level of incompetence.

We wonder if there couldn't be another major factor to explain the high failure rates. We turn our attention to the Review of the Literature in the hopes of finding such a factor.

REVIEW OF THE LITERATURE

Introduction:

There is a strong popular belief that self concept and motivation are intricately related to explain performance. Some of the most often cited examples are the insurance empire created by W. Clement Stone; the public speaking training sessions by Dale Carnegie; the program for the development of personal fortitude by Norman Vincent Peale, and the countless numbers of leadership training programs.

University Associates, Publishers and Consultants, which evolved along with the human relations movement, has attempted to collect, publish and distribute such leadership training materials. The seventeen volumes, to date, of the Structured Experiences in Human Relations Training have done much to spread the belief that positive self-concept of self-evaluation and the examination of one's motives leads one to success.

We reviewed the literature in Education and Psychology to substantiate with research the belief that student self-concept and motivation affect academic performance. The following Review of the Literature begins with methodological considerations, then proceeds to a discussion on the measurement of self-concept and intrinsic motivation which is in turn followed by a critical examination of pertinent research. The chapter closes by attempting to show that student perceived meaningfulness are personality traits which may be easily and accurately reported to professors by students. This in turn should help professors to prepare lectures, laboratories, and discussions that are more likely to arouse student participation and performance.

Methodological Considerations:

Although it is unusual to report those steps taken to search the literature, the author feels it is necessary in order to demonstrate that their is very little experimental evidence to support the common belief that the self-concept and motivation of community college* students effects their academic performance.

The thrust of the community colleges began in the 1960's. Consequently, our systematic manual and computer-assisted review of the literature focuses on the past two decades.

Our manual search focused on Psychological Abstracts, Books in Print by Subject, Dissertation Abstracts International, and the collection of unpublished masters theses and doctoral dissertations at Laval University. We solicited the services of the Centre d'animation, développement et recherche en éducation (CADRE) who provided three promising bibliographic sources. Two pieces of very valuable information emerged: Hanson (1973) and Langlois (1975). The study by Langlois is the only experimental eivdence we found to measure the effects of a *cégep student's* self-concept on her academic performance. This piece of research will be reviewed in a later part of this chapter.

Hanson (1973) provided a lenghty and "comprehensive overview" on studies relating student self-concept and motivation to their academic achievement.

> The sources used in the development of this bibliography include: Education Index; Current Index of Journals in Education (CIJE); Educational Resources Information Center (ERIC); Subject Guide to Books in Print: State Educational Accountability Repository (SEAR) files (a CAP project containing over 700

*Throughout this discussion we refer to community college or junior college or cégep students. For all practical intents and purposes the three are alike.

> publications on assessment and accountability programs from the 50 states), and the periodical collection in the Professional Library at the Department of Public Instruction, Madison, Wisconsin.
>
> (Hanson,1973; Preface, page i)

In brief, our examination of the 139 references Hanson cited failed to uncover any research that dealt in any aspect with community college students. We then relied on the facilities of ERIC, the American Association of Community and Junior Colleges, and Psychological Abstracts Information Services (PASAR) for further information. The results were more encouraging. There were six new experimental studies —— two on motivation and four on the self-concept. The critical appraisal of the research is deferred to a later section.

ERIC listed a very interesting report by Moore (1976) and a book by Purkey (1970) on the Self Concept and School Achievement. Purkey's brief and excellent overview of the research on the relation of self-concept to academic achievement led him to formulate a model of the self-concept based on all the levels of education. Mostly he expounds on the implications between research results and his model for improving the educational process. The systematic verification of his references failed to turn up any experimental evidence for the belief that the self-concept of *community college* students is related to their academic achievement.

Moore (1976),in a report on the results of a survey (Moore, 1975) of 250 junior colleges, reveals that 90% of the counselors and professors believed the student's self-concept to be related to his academic achievement. What startled Moore, and this author, is that *none of them* had administered self-concept tests, let alone do an experimental investigation to test the validity

of the assumption. We share Moore's criticism that we accept all to readily popular ideas of the causes of achievement without hard and unequivocable experimental evidence.

The same criticism may also apply to motivation because:

> To my knowledge, not a single community college administers a test of any kind to determine motivation for academic achievement.
>
> (Moore,1976; page 17)

The following, and rather long quote from Moore (1976), succinctly summarizes our feelings and concern for the problem of failures amongst community college students.

> This is the crux of the issue. Educators are right to associate motivation with learning. But their negative, defensive attitude —— "I can't do anything if they don't want to learn" —— must be replaced by a positive approach based on the principles of andragogy: the art and science of helping adults learn (Knowles,1970). Some instructors believe that a student ought to be ready for learning when he comes to the class. His plans should be clear; he should know what he is doing and what the risks are. According to the cognitive theory of motivation, knowing his goal should be sufficient motivation. And as the instructors see it, if this knowledge is lacking, the student shouldn't be there. This is a near formula, but it simply doesn't work in practice. Goal identification and a positive attitude toward learning do not guarantee motivation to achieve. Perhaps the goal is not the student's, or perhaps his positive attitude does not extend to those areas prescribed by his teachers. In any case, the teacher must accept some responsibility for helping the student determine his objectives and then help him reach them.
>
> What, then, can the teacher do? Obviously motivation strategies are necessary. Ways must be learned to make students receptive to learning activity. Every student, motivated or not, is likely to respond to the good human relations practices promoted by the so-called helping professions: liking and respecting the student, listening to him, building his confidence. Personal honesty and high expectations are

> helpful as well. It is more productive to determine what stimulates a student than to argue that the student cannot be stimulated. The teacher will probably discover that some persons work for tangible rewards, others for abstract gifts; some respond to praise and some to criticism. By applying this information the teacher can increase each student's interest in learning.
>
> (Moore,1976; page 18)

Some may argue that in view of the scarcity of research on the population of community college students we should turn our attention to experimental results obtained with high school or university students.

In fact the student's self-concept is relative to a particular time in his psychosocial development (Calhoun & Acocella,1978; Erikson,1968; Grinder, 1973; Muuss,1975; and Newman & Newman, 1975). The developmental stages of the self-concept during the high school years are quantitatively and qualitatively different from those of the university years. The self-concept is the sum total of one's perceptions about self-knowledge, self-expectations and self-evaluations. These are derived from one's interactions with the parents. As children grow into the high school and university ages they become less dependent upon the parents and more dependent upon the peer group, which is representative of society-at-large.

The self-concept can be the object of its own study (Mead, 1934). The person needs information to help him define the difference between what he perceived himself to be and what he should perceive himself to be. In order to minimize the time required to accomplish this and to maximize the benefits for changing, the person relies on significant others in the community. The most important source of significant others in the adolescent student's social circle, besides his parents, is the persons in the educational institution he

attends.

Stark and Traxler (1974) have experimentally confirmed Erikson's (1968) theory that the process of identification continues to be affected by significant others until late adolescence.

> The final identity, then, as fixed at the end of adolescence, is superordinated to any single identification with individuals of the past: it includes all significant identifications, but it also alters them in order to make a unique and reasonably coherent whole of them.
>
> (Erikson,1968; page 161)

The student's knowledge, expectations and evaluations of himself during high school and university are seen as affected by the community of peers and significant others in that milieu. We believe that experimental evidence from studies with subjects from high school or university is very tentative and highly hazardous for generalizing to community college students. Furthermore, the student's motivation is greatly influenced by his perceptions of the physical, intellectual and social-emotional environment of the institution he attends. The modification of his self-concept is dependent upon his ability to learn to recognize and to acquire material that contributes to minimizing the difference between his actual and ideal self-concepts. In this context motivation or the willingness to learn is a sub-structure of one's self-concept which operates to enhance the self-concept.

Since the gradient of approach or avoidance is a common perceptual factor that affects motivation to perform a task, we can expect that the students' perceptions of the community college are motives related to his self-concept. Bauer and Snyder (1972) report that there is nomological validity* for Erik-

---

*Nomological validity meand convergent and discriminant validity. COnvergent validity refers to a high correlation betwen independent factors measuring the same variable. Discriminant validity refers to low correlations between factors of different variables.

son's theory that achievement motivation is indeed related to identity development during the late adolescent or early adult period. They administered a measure of ego identity (Rasmussen's Ego Identity Scale) and another measure for achievement and affiliation motivation (Thematic Apperception Test) to 158 male college students in the 17-25 age range. Bauer and Snyder confirmed the experimental hypothesis that highly motivated students would show higher levels of identity integration. It appears that achievement and affiliation motivation vary systematically with the level of identity development.

We conclude then that the development of self-concept and motivation of students in community college is different from that for high school or university students. Consequently, we cannot accept that the self-concept and motivation studies using high school or university students may be generalized to the population of community college students.

The Measurement of Self-Concept and Motivation:

There are two problems with studies that purport to study the self-concept and motivation. On the one side there are difficulties in finding suitable instruments to measure either construct. The other problem is in finding a parameter for the self-concept and motivation that is amenable to experimental investigation. We will treat these two problems separately in order to maintain a clear perspective on the problem of the self-concept and motivation of community college students in relation to their academic achievement.

Wylie (1974),in a systematic and critical review of the literature on the self-concept, has shown that there are dozens of definitions for "self-concept". Each researcher defines the term, more or less arbitrarily, so

that it may be operationally studied. This makes comparisons between studies difficult and the generalization of results hazardous.

Epstein (1973) argues rather convincingly, in a review of the major definitions and theories on self-concept, that it is possible to arrive at a broad definition of self-concept to accommodate both the subjective/phenomenological and objective/behavioristic points of view.

> ...(T)he self-concept is a self-theory. It is a theory that the individual has unwittingly constructed about himself as an experiencing, functioning individual, and it is part of a broader theory which holds with respect to his entire range of significant experience. Accordingly, there are major postulate systems for the nature of the world, for the nature of the self, and for their interaction.
>
> ...The most fundamental purpose of the self-theory is to optimize the pleasure/pain balance of the individual over the course of a lifetime. Two other basic functions, not unrelated to the first, are to facilitate the maintenance of self-esteem, and to organize the data of experience in a manner that can be coped with effectively.
>
> (Epstein,1973; page 407)

This is an important definition because it integrates motivation and self-concept within the level of perception of the person. The synthesis of motivation,self-concept and perception may be operationally defined as "relevance". How relevance related to the educational process has been succinctly summarized by Francis:

> Emphasizing the concrete and concentrating on the way students use the word "relevance" to describe their experiences suggests a fourth definition —— the primary focus of this paper. Relevance, in this view is a psychological construct describing the relationship between external events (e.g., the instructional process) and the ones who experience them (e.g., the students). ... Each student is affected in-

> directly by a teacher, by his ideas, and by the manner of his presentation, through the psychological medium of that student's unique perception. This is what is meant by the statement that students respond to instructional practices as experienced. Teachers respond analogously to students; and it is in the working out of their relations with each other, their inter-experience, that the instructional situation succeeds or fails. Relevance is not then an intrinsic quality of some external event (a book, a course, etc.) but a construct denoting congruence between student and teacher perceptions of the classroom experience. To stretch but slightly the meaning of a highly technical statistical term, one might say that relevance is the student's name for "goodness-of-fit" in teacher-student interaction.
>
> (Francis,1973; pages 327-328)

Parker (1966) attempted to determine if there exists a significant difference between what the individual is willing and able to tell someone about himself (self-report) and what he actually is (self-concept). Thirty sixth grade students were exposed to a projective "picture story test" from which the professional examiner inferred the student's self-concept. These students also completed at this time, and again under conditions of supposed anonymity, a self-report inventory designed by Parker. The students' teacher then expressed a desire to receive this information so that she could help students "learn better". Students sere asked to complete the tests again. This time there was an emphasis on the social expectancy that the teacher would use these results.

Parker reports that correlations between both the self-report and the inferred self-concept in the pre- and post-social expectancy set remained relatively well correlated. A comparison of the correlations under confidential and non-confidential conditions revealed that a highly significant difference ($p > .01$) existed between both. Parker concluded that there was a difference between the self-concept and the self-report that the student was

willing to make under confidential versus non-confidential conditions. The non-confidential reports of the self-concept are likely to be influenced by social expectancies.

The study would have been substantially strengthened through the utilization of standardized tests. An examination of such test follows this discussion. A cross-sectional and random sample would also contribute to the generalization potential of his results. Also, the subject matter taught or the teacher's characteristics are possible sources of systematic error. Brookover, Thomas and Paterson (1964) have shown,in a study with 1050 seventh grade students,that the self-concept is significantly and positively related to interactions with significant others.

In conclusion, the measurement of self-concept and motivation will necessitate an experimentally validated and reliable instrument from a sample representative of the community college population. A possible way of establishing the validity of the self-concept will also need special attention. The measurement of the student's "relevance", as an operational construct of self-concept and motivation, will also need similar study.

The Community College Motivation Inventory (CCMI) by Caughren (1978) meets these criteria. The six scales of the CCMI are: Intrinsic Motivation (IM); Self-Enhancement (SE); Person Orientation (PO); Goal Deficiency (GD); Sex Differentiation (SD); and Infrequent Response (IR). Caughren is still in the process of determining validity and reliability for the SD and IR scales. As with all good test developers, Caughren reports that validity is still "sketchy" for the IM, SE, PO and GD scales. However there is very strong construct validity between the CCMI and the California Psychological Inventory (CPI), the

Omnibus Personality Inventory (OPI), the Minnesota Multiphasic Personality Inventory (MMPI), and the Edwards Personal Preference Schedule (EPPS). Furthermore, test-retest reliability has shown the subscales to be stable. All these factors indicate that the CCMI is a valid and reliable instrument that minimizes the difference between the self-report and the actual self-concept of the respondent. Since the CCMI has been validated on several hundred students,and on several samples from the Community College student population, its use in this project is highly warranted.

Pertinent Research:

There are only four studies which report on the relation of student self-concept to his academic achievement. For want of a better approach, the experiments will be presented in their chronological order.

Schaar (1967), in his doctoral dissertation, reports on the "changes in academic success and self-concept of low-achieving community college freshmen". Fifty high risk community college students, about to enter university, were matched and assigned to one of five groups. Besides the control group, the students were exposed to one of four counseling situations, the independent variable. Grades earned at the end of the pre-university English class were the dependent variables. Schaar reports that the most effective procedure in predicting academic achievement was the "...40-minute individual supportive counseling" . There were no measured changes in student self-concept according to pre- and posttest results on the California Psychological Inventory (CPI). Schaar concludes that the identification and placement of high risk community

college students into "proper" supportive counseling experiences can contribute significantly to avoiding a disastrous university experience. The onus of change rests on the university admission, placement and counseling services. Our collegiate system of education already has such policies for admitting students from secondary schools. The problem, as we see it, is to identify and to help motivate those students who are developping, while in cegep a history of failures.

The English and Mathematics Departments of our Campus have been actively involved in conducting workshops to assist students. These classes are manned by volunteer professors for the most part, and supplement the regular office hours of the faculty. The only other avenue opened, so it seemed to us, was to implement an in-class tactic to motivate students in all disciplines. Cegep admission procedures, counseling services, a resource center, and free tutorials for students didn't seem sufficient. Vis-à-vis such devoted effort it is disheartening to still have high failure rates.

Ankenbrand (1971), in an experimental investigation,attempted to enhance the academic performance of students entering a community college as "high risks". He introduced, as the independent variable, group versus leader structured experiences in human relations classes for these students. Pre- and post-test measures on the Tennessee Self-Concept Scale (TSCS) and grade-point averages, the dependent variables, revealed that self-concept is enhanced but that grade-point averages did not significantly change. Ankenbrand concluded that firm leadership, as expressed in leader structured experiences that emphasize non-academic factors, tends to enhance the initially negative self-concept of "high risk community college freshmen" but does not necessarily improve academic achievement.

The weakness in this study is the assumption that high risk community college students,who registered for the human relations classes, were no more or no less interested than other students. This assumption needs to be examined closely. In the relationship of self-concept to academic achievement, students with a low self-concept tend to also have a low self-esteem (Centi, 1965; Marecek and Mettee,1972). Furthermore, students with low self-concept, low self-esteem and poor academic performance tend to seek approval or success through interpersonal interactions (Borislow, 1962; Doyon;1979;Kubiniec,1970). A course in human relations is especially likely to be perceived by high risk students as an agent that facilitates these interpersonal needs. In other words, Ankenbrand's students probably never perceived the academic side of the human relations course. A pre- and posttest measure of attitudes towards the academic and interpersonal aspects of the human relations classes would have been necessary.

Langlois (1975) has been one of the very few to study the relation of self-concept to the academic achievement of *cegep students*. Twenty second year females at the Cegep of Rimouski were selected from the Biological Techniques Program on the basis of a history of academic success or failure. This correlational study attempted to determine the similarities and differences of the student's self-concept in relation to academic success or failure.

The Biological Techniques students were chosen because of the combination of lectures, laboratories and practicum in their program of studies. Unfortunately only females were enrolled in these programs. Langlois' results are only speculative because of the small number of subjects in each of the success (N = 10) or failure (N = 10) groups and obviously because of the absence of data on males.

Langlois' study reveals that success subjects are self-motivated and confident in their own abilities. That is, they are not dependent upon the teacher nor limited by his abilities. These females are concerned with competency which is often expressed by them as a need for professional development. The failure group of females rely on significant others to provide them with confidence which supports their need to have other people value them. These females are apparently more concerned with interpersonal relations and fail to show concern for developing some sort of professional development. These differences, amongst others, has led Langlois to conclude that there are substantial quantitative and qualitative differences in the self-concepts of females who are academically oriented towards success or failure.

The overiding limitation is the absence of an experimental manipulation. Granted that we need descriptors or correlative studies; but more importantly we need instruments for *predicting*. If we are to understand and to predict the academic behavior of students in cegep, then experimental evidence will have to be forthcoming.

Nichols and Shauffer (1975) studied the relationship in 158 junior college females, between self-concept, attrition and academic ability and achievement. These authors were concerned with statistically sophisticated techniques (Chi Square, Linear Regressions and Analysis of Variance) to ascertain the amount of variance self-concept could explain in academic achievement. Results reveal a statistically non-significant relationship between self-concept and academic achievement. However, self-concept and academic ability when combined became statistically significant but could not differentiate amongst students who were to pass, fail or transfer. These researchers concluded that other non-academic factors must be explored to explain the remaining variance in

order to predict academic achievement.

The overall difficulty with their study is the assumption that the Tennessee Self-Concept Scale (TSCS) is an appropriate measure of the academic self-concept of junior college students.The major contribution is the suggestion that interaction effects need to be considered and that the amount of variance that any single variables accounts for is an integral part of research.

Our review has thus far laid the theoretical and research foundation upon which rests the belief that student self-concept and motivation are related to academic performance. The CCMI has been shown to be a valid, reliable and appropriate instrument to assess the community college student's self-concept and motivation in relation to his performance goals. We also proposed that the student's report of "relevance" or "meaningfulness" could be a non-academic factor susceptible of accounting for some of the variance in academic achievement motivation. We should like to turn our attention to a method of assessing this "relevance" and then proceed to show that the measurement and utilization of the student's relevance is an appropriate concern of the cegep professor.

Kazanas et al. have developed the Meaning and Value of Work Scale (1975) which appears to meet the needs we have thus far identified. Kazanas and his colleagues (1973), in an exhaustive survey on the Meaning and Value of Work, propose that "...work requires physical and/or mental exertion (page 6)" On the basis of their discussion and on this part of their definition for "work", we suggest that "to study" and "to work" are similar.

Kazanas, Hannah and Gregor (1975) produced a self report "...instrument to measure the meaning and value associated with work." The validation, reliability and standardization of the Meaning and Value of Work Scale (MVWS) lends

credibility to the instrument. Content validity is .91 and split-half reliability is .89 for the Meaning of Work Scale (MWS). We are limiting ourselves to the MWS because the author in a previous publication (Talbot,1980) has shown that the MWS rather than the Value of Work Scale (VWS) seems related to the prediction of academic performance. Several advantages of this instrument, besides statistical validation, are: appropriateness of population and sample ("...primarily for grades ten through fourteen"), and its desing as "...a valuable diagnostic tool for counselors and educators...").

With respect to the diagnostic value, Kazanas et al propose that the MWS is a composite of seven subscales: Opportunity; Philosophical Orientation; Societal Orientation; Experience; Satisfaction/Status; Activity; and Productivity. The 40 items of the scale account for 44.6% of the total variance. The rank order of these sub-scales permits one to surmise the respondent's meaningfulness for work. The aggregate of rank orders should then delimit the meaningfulness ofwork for a group of respondents. We believe that this variable is amenable to experimental manipulation by professors who wish to be aware of the affective-cognitive congruence or meaningfulness that students experience or *wish* to experience in class.

In conclusion, the MWS appears as an instrument capable of determining the fit between the student's perceptions in class and the professor's intent to fit the course to the student.

Roueche and Kirk (1973) have reviewed the literature on the high risk community college student, and one of their conclusions is most appropriate:

> We are all aware that *relevance* has become just another meaningless term when used in higher education. Yet it is important to design the curriculum around the interests of

> students if programs are to overcome the negative feelings and attitudes that most high-risk students bring with them to the community college. It is unfortunate that college curricula are determined more by tradition than by current student or societal needs.
>
> For the student who goes to college as a normal part of growing up, traditional curriculum offerings are part of his college expectations. However, the increasing numbers of new students attending community colleges expect to see some payoff —— some relationship between what they are asked, indeed required, to learn and the real world. Curriculum dictated by tradition makes little sense to such students. ...
>
> Most community college instructors, even those honest, caring ones, still have a basic subject-matter background. Most teachers still consider themselves subject-matter specialists. How ironic that the best strategies for having students master content are always tied to their perceptions of its relevance and value to them ! Content should not remain static or assumed.
>
> Nontraditional students need to see why they are required to learn a particular subject. They seek higher education for very practical reasons —— they are looking for particular jobs, which will produce higher incomes and the benefits of a better life. They seek a particular program to reach a personal goal. In each learning experience the student needs to see he is getting closer to his goal...
>
> (Roueche and Kirk,1973; pages 85-86)

Implicit in this passage is that relevance is conducive to autonomy of students. An autonomous student then is capable of understanding himself and the society in which he lives.

Ralph (1973) and Axelrod (1973) argue that the "stages of faculty development" and that the "professor as artist at teaching" include the professor's responsibility to help students become autonomous persons.

> ...(I)ncluded in his philosophy of education is explicit

> concern with helping students develop a sense of values or character. He has a real appreciation of the student's situation and how material may best be learned. ... (H)e is able to find abstraction in relationships with students of whom he may be critical. This tolerance is a conscious or explicit construct; he is aware, that is, of having developed a sense of tolerance, an ability to live with diversity. Considerable cognitive complexity is evident at this stage. The prototypic faculty member is able to accept contradiction and ambivalence in human functioning and irony in social processes and to carry on effectively within such contexts.
>
> (Ralph,1973; page 65)

> To summarize: among evocative teaching styles —— the ones in which it is possible to rise to the level of art—— there are four distinct prototypes. The most common is the principles-and-facts instructor. He has mastered the cognitive knowledge of his field, and he teaches what he knows. The second model —— the instructor-centered prototype —— also emphasizes cognitive knowledge, but his unique point of view and forceful personality organize the material in a special way. He teaches what he is. Of the two student-oriented models, the first focuses on the development of intellectual skills. He trains minds. The other student-oriented prototype is concerned with affective as well as cognitive knowledge. Heworks with students as people.
>
> (Axelrod,1973; page 25)

The descriptions by Ralph and Axelrod are echoed in the conclusions of Doyon (1979) who addressed himself to the development of the cegep student as a person.

> Si nous ne voulons pas qu'ils institutionnalisent la facilité et la neurathénie, nous devons les aider, par le Cégep, à mieux prendre en main leurs responsabilités, par des méthodes pédagogiques mieux adaptées qui leur permettraient, surout en deuxième année, de prendre en main leur auto-développement affective comme pédagogique et intellectuel. ...
>
> Les étudiants de collège ne sont pas encore complètement adultes mais se trouvent en période de structuration de leur identité personnelle et sociale. Nous devons les

> aider à mieux se prendre en main par des méthodes pédagogiques plus individualisées, pour qu'ils deviennent plus autonomes, car c'est peut-être là la caractéristique la plus importante d'un adulte: être autonome, c'est-à-dire, interdépendant face à son environnement immédiat.
>
> (Doyon, 1979; page 84)

The Cegep professor must continue to make efforts to have meaningful material prepared and ready to link together, based on the student's efforts to understand himself and the society in which he lives.

There are many conscientious professors who will be offended by this report because they are making attempts to motivate their students through well-prepared meaningful lectures and laboratories. However, a theoretically sound instrument to measure the student's perception of relevance for the course is lacking. That is, the professor does not have a reliable way of determining how his efforts fit with the student's expectations in the course. The method we are advocating affirms the professor is the sole agent for course content and structure. The approach does not jeopardize nor usurp his authority or responsibility.

Our final conclusion is that the learning equation is:

Learning is a function of the student's self-concept and motivation which are expressed in his meanings of work.

- 0 -

METHODOLOGY

Hypotheses:

Intrinsic Motivation:

H_1: Intrinsic motivation scores of students during the experimental period (IMB) will be significantly improved compared to their intrinsic motivation scores (IMA) during the control period.

Self-Enhancement:

H_2: Student self-enhancement scores during the experimental period (SEB) will be significantly improved compared to their self-enhancement scores in the control period (SEA).

Person Orientation:

H_3: Student person orientation scores during the experimental period (POB) will be significantly improved compared to their person orientation scores during the control period (POA).

Goal Deficiency:

H_4: Student goal deficiency scores during the experimental period (GDB) will be significantly reduced compared to the goal deficiency scores during the control period (GDA).

Academic Performance:

H_5: The academic performance of students in the experimental period will be superior to their academic performance during the control period.

H_6: Intrinsic motivation is significantly related to academic performance.

H_7: Self-enhancement is significantly related to academic performance.

H_8: Goal deficiency is significantly related to academic performance.

H_9: Academic performance of failure-oriented students during the experimental period will be significantly greater that their academic performance during the control period.

Predicting Academic Performance:

H_{10}: The multiple regressions and correlations of the Community College Motivation Inventory (CCMI) scales —— Intrinsic Motivation (IM), Self-Enhancement (SE),Person Orientation (PO), and Goal Deficiency (GD) —— with grades will produce a significant correlation coefficient and equation with which to predict academic performance.

H_{11}: The multiple regression equation thus derived will be applied to another sample of students who complete the CCMI (cross-validation) to determine how well it can predict their academic performance. We hypothesize that this equation will be able to predict academic performance.

Evaluation Instruments:

The following reasons led us to select Caughren's (1978) Community College Motivation Inventory (CCMI) to assess the student's self-concept and intrinsic motivation; also Kazanas et al (1975) Meaning of Work Scale (MWS) was selected for the same reasons.

- —— the adequacy of generalizing from the population sampled
- —— reports on the size and characteristics of the sample
- —— the appropriateness of statistical data
- —— reports on validity and reliability
- —— operational definitions and theoretical constructs

Design:

The use by the professor of the student's reported meanings of work, to prepare lectures is the independent variable. Student self-reports on self-concept and motivation are moderator variables. Student academic performance is the dependent variable.

The design is a basic pre- and posttest measure with each subject acting as his own control. An additional cluster of students will serve as a control group throughout the semester. This will enable us to draw conclusions from the results of comparaisons between changes in the dependent and moderator variables in students as a function of teacher and/or course effects.

To counter social expectancy effects, which may interact with the utilization of the student's reported meanings of work (independent variable), all groups will be administered the measurement instruments (CCMI,MWS), and one of the four or five classes for each teacher will be randomly selected to serve

as the control group. The first half of the semester will serve as a control period for all groups. This will yield baseline data to be compared with the data generated by either the continuing control group, or the treatment groups during the second half of the semester.

These procedures should minimize the likelihood of systematic error. Possible sources of random error include the professor's sex, scholarity and years of teaching experience. The professors who volunteered for this project are a non-random but representative cross-section of the professorial body in cegeps. We have female and male professors, ranging in scholarity from baccalaureat to doctorate and in experience from 3 to 15 years or more..

Another point is the problem of attrition or abandons. A student who at mid-semester receives a poor grade is free to withdraw from the course. Students who will avail themselves of this option are not considered as failure-oriented but rather as abandon-oriented. There appears to be two distinct types of ego-defenses operating to distinguish students who are failing but persist from students who are failing but abandon (Epstein,1973). It has been our experience that students who are failure-by-abandon types usually drop the course within three weeks from the start of the course. Consequently, we don't expect to have a serious problem with attrition.

Subjects:

Students matriculating for the Fall, 1980 semester at Champlain Regional College, St-Lawrence Campus, will serve as the population of subjects for this experiment. Of the nearly 650 students expected, approximately 300 students are expected to enroll for the courses of the professors who volunteered.

All students are English-speaking and most are also fluent in French. Both first and second-year, male or female students from nearly all disci-lines offerred at St-Lawrence, will be represented in the sample. With very few exceptions the students range from 16 to 20 years of age.

Stimuli:

There are two proposed stimuli. One given to students to justify their participation and to minimize social expectancy, the other is the real use, by the professor, of the student's results to prepare lectures,discussions and laboratories.

Directions given to students to complete the questionnaires at mid-semester are printed on the questionnaires (See appendices, page 64 These directions will also be read by the professor to the class. The questionnaires will also be administered again at the end of the semester but with slight changes in the directions (See appendices, page 65).

Procedures:

In those classes with teachers who volunteered for the project, students were asked to complete the Community College Motivation Inventoy (CCMI) and the Meaning of Work Scale (MWS) at mid-semester, prior to receiving their mid-semester grades.

Approximately one-half of the number of classes, for any teacher, were randomly assigned to the experimental treatment (Category 1: EXP). The other half or so formed the control group for teachers who volunteered (Category 2: Half-Control). To reduce error introduced by teacher voluntarism another

group of four teachers furnished mid-semester and end-of-semester grades so as to form an unbiased control group (Category 3: Full-Control).

The student scores were rank-ordered to determine the top two ranks for each student. The frequency distribution of these rankings produced a class mode which revealed the most frequent preferences for meaningfulness in any single class. The professor for each experimental class was given this information Based on these results the professor was coached into preparing lectures and labs to incorporate, into the experimental classes, what the majority of students felt would be meaningful "work"(study).

The coaching consisted in helping the professor to interpret the MWS subscales in the light of his discipline. Specifically, the professor continued to determine the course plan and content during the second half of the semester. However, he also attempted to explain (whenever and wherever he thought possible) the material in the light of the rank-ordered suggestions made by students in that class.

At the end of the semester, students in the experimental and half-control groups completed the CCMI for a second time. The mid-semester and final grades of students from all three categories —— experimental, half-control or full-control —— were obtained and analyzed.

Analysis of Data:

The internal validity of our research rests on the assumption that there were no significant differences operating amongst the groups with respect to the dependent variable (grades), before our research. To test this assumption we assumed there was no difference in the class means for students at mid-semester amongst the experimental, half-control or full-control categories.

Since the three categories are independent, and although we have interval levels of measurement, we prefer the Kruskal-Wallis one-way analysis of variance to avoid the assumptions inherent in using the F-test and also to increase the external validity (generalization value) of our results. Since the sample size is large we safely minimize both Type I and Type II errors and thus can accept an 05 level of significance (i.e. being 95% sure that effects are not due to chance). Thus, an $H \geq 5.40$ with $df = k - 1 = 2$ has probability of occurrence under H_o of $p < 05$. Therefore we may conclude, with 95% certainty, that there are no significant differences in mid-semester class means for students in one or the other of the categories. Specifically, student grades at mid-semester did not significantly differ from each other on the basis of category to which students were assigned.

Further Kruskal-Wallis analyses of grades (Table 15 and 16, pages 54 & 55) confirm that students, either failing or passing, and in any of the three categories, do not differ significantly at mid-semester. The calculated H-statistic for students passing or failing at mid-semester (H_{passMT} and H_{failMT} respectively) are 0.3438 and -0.7254, respectively. Thus, $H_{passMT} \geq 0.3438$ with $df = k - 1 = 2$ and $H_{failMT} \geq -0.7254$ with $df = k - 1 = 2$ have probabilities of occurrence under H_o of $p < 05$. Therefore, we may conclude, with 95% certainty, that there are no significant differences in the mid-semester academic performances of students passing or failing.

Our intent to explain possible differences in academic performances following the experimental treatment (student perception of meaningfulness incorporated into class preparation) in terms of changes in the direction and magnitude of self-concept and motivation also requires statistical analysis. The

Wilcoxon matched-pairs signed-ranks statistic (T) is useful for this purpose. Specifically our null hypothesis (H_o) is that there is no difference of the total CCMI and CCMI subscales scores for half-control students between mid-semester and the end of the semester. The T-statistic is appropriate because the difference in scores is from two related samples in which each student acted as his control. The significance level is set at 05 that is, we want to be at least 95% certain that the results are not due to chance. Specifically, the hypothesis is that there were no changes in total CCMI or CCMI subscales between mid-semester and end of semester for students from category 2 (Half-Control). However, the experimental students (Category 1) are predicted to increase their intrinsic motivation and self-enhancement as a result of having been exposed to the treatment.

The total CCMI scale scores (Table 5, page 44) as well as the Self-Enhancement (Table 6, page 45), Person Orientation (Table 8, page 47) and Goal Deficiency (Table 9,page 48) subscales of the CCMI did not, according to the T-statistic, change significantly in magnitude or direction between mid-semester and end of semester for students in the half-control category. The Wilcoxon T-statistic reveals that experimental category students showed a very high improvement, significant at 005 (99.5%), in total CCMI (Table 10, page 49)and Intrinsic Motivation (Table 12, page 51). However there were no significant improvements in self-enhancement (Table 11, page 50), Person Orientation (Table 13, page 52) or Goal Deficiency (Table 14, page 53). These results, taken collectively, appear less spectacular when one considers that a significant increase (02) in intrinsic motivation also occurred in the half-control category (Table 7, page 46).

Thus, we may conclude that there were significant changes in direction and magnitude for the total CCMI and intrinsic motivation scores for experimental students, with some apparent reservation due to the increase in intrinsic motivation in the half-control category, when there should have been none. A possible interpretation of these results is that both the half-control and experimental categories were under the responsibility of the same teacher. A double-blind situation, that is keeping students and teachers unaware of treatment schedules, would be preferred, but is impossible given the nature of the treatment relative to the design. This seems a very plausible answer since some teachers had expressed concern about their ability to refrain from applying the "treatment" to the half-control group, if they noticed improvements in the experimental group.

In terms of the hypotheses formulated, we may accept H_1, and reject H_2, H_3 and H_4. That is, intrinsic motivation significantly improved during the experimental period but not self-enhancement, person orientation or goal deficiency.

The Wilcoxon matched-pairs signed-ranks of academic performance between mid-semester and the end of the semester for the full-control,half-control or experimental students (Tables 2,3,4, pages 41,42 & 43)reveals that a significant increase occurred in the half-control (05) and experimental (01) catefories.

Students who failed seemed, as a whole, to have changed the most (Table 17, page 56) in either the half-control or experimental category. Data of Table 19 and 20 (page 58) suggest that no significant differences between performances in half-control and experimental can be attributed to the number of students who passed. That is, the increased academic performance

of students appears to be due to the increased ability of several students rather than to many students who increased performances only sligthly. Thus we can accept H_5. That is, increased academic performance of a few students explains that academic performance increased in the experimental group.

The CCMI subscale scattergrams and the Pearson Product Moment Correlation Coefficient (PPMCC) between these subscales and final grades (Figure 5) produced the following regression equation:

$$\text{Final Grades} = -0.3796*GD + 0.1595*SE - 0.2891*PO + 0.3268IM + 68.4578$$

This regression equation was then applied to the mid-semester data of students to produce a predicted final grade. The predicted final grades and the actual grades earned were then studied. The correlation between predicted grades and actual grades was 0.3355, which is significant beyond 99.9%. We could expect though that such a highly significant correlation would occur since we were correlating two variables that had been fitted together by regression. The true test of multiple regression equations is the extent to which it explains the variance of the variables being fitted. In this case the amount of variance accounted for by multiple regression between the CCMI and final grades was 11.256% Our hopes of predicting academic performance based on actual measures of IM,SE, GD and PO in the CCMI, then do not appear worthwhile. Although we have shown H_{10} to be significant.

Nonetheless, an analysis of variance seemed plausible given the significance of each CCMI subscale with final grades (See figure 5). The utilization of a three-way analysis of variance necessitates that we meet basic assumptions for its use. Since the variables under study are continuous

	FIN	IMB	SEB	POB	GDB
FIN	1.0000 (471) P=******	0.2139 (471) P=0.000	0.0758 (471) P=0.050	-0.1034 (471) P=0.012	-0.2108 (471) P=0.000
IMB	0.2139 (471) P=0.000	1.0000 (471) P=******	0.1306 (471) P=0.002	0.0602 (471) P=0.096	-0.1319 (471) P=0.002
SEB	0.0758 (471) P=0.050	0.1306 (471) P=0.002	1.0000 (471) P=******	0.0930 (471) P=0.022	-0.0234 (471) P=0.306
POB	-0.1034 (471) P=0.012	0.0602 (471) P=0.096	0.0930 (471) P=0.022	1.0000 (471) P=******	-0.2655 (471) P=0.000
GDB	-0.2108 (471) P=0.000	-0.1319 (471) P=0.002	-0.0234 (471) P=0.306	-0.2655 (471) P=0.000	1.0000 (471) P=******

Figure 5: Pearson Product Moment Correlation Coefficients between student scores on the subscales of the CCMI and their final grades.

and normally distributed the only major problems were sampling and cell size. But before we can examine these two problems we need to consider the data base and its breakdown into sub-variables or cells. Of the total number of students (N = 471), those whose scores were in the upper or lower half on any one CCMI scale were placed in the High or Low breakdown. The operational limits for the three variables studied are: High (33 or more) versus Low (32 or less) Motivation; High (39 or more) versus Low (38 or less) Self-Enhancement; and High (22 or more) versus Low (21 or less) Goal Deficiency. The procedure to select the cell size (n = 11) was based on the smallest observed frequency for any one cell. Thus, the lowest cell count was 11 students who were classified as Low Motivation, Low Self-Enhancement, and Low Goal Deficiency. The other seven cells were formed by randomly selecting 11 scores from the population of scores available for that particular cell. Thus we were able to meet the criteria of random selection and equal cell frequencies.

Table 21 is the breakdown of the 2x2x2 analysis of variance, fixed effects model. This led to an analysis of the variation (Table 22, page 60) which identifies the influence of IM, SE and GD on grades. The unique influence on grades stems from the student's intrinsic motivation. However,

it is possible to state that through Fisher's Least Significant Difference (LSD) method that the higher the intrinsic motivation the better the academic performance and that somehow the higher the self-enhancement the better the academic performance. That is, we now have proof that helping some students, who would otherwise fail, to increase their intrinsic motivation and self-enhancement leads to better academic performance. We are able to affirm that adding student perceptions of meaningfulness directly enhances academic performance. However, the theory that enhancing self-concept, through this method, leads directly to academic performance is unsupported. In effect, we are able to accept the hypothesis that intrinsic motivation is related to academic performance (H_6), that self-enhancement is also related, in a way which we cannot now explain, (H_7), and finally goal deficiency is not related to academic performance (H_8). We are using the word "related" in the sense that intrinsic motivation is causally related to academic performance by the addition of meaningfulness. We use the word "unrelated" to mean that self-enhancement is correlated to academic performance and that at this time, while we cannot specify by what factor(s), we do know it is not by meaningfulness.

The prediction of academic performance based on multiple regressions with CCMI scores appears promising on the basis of a check of internal consistency of the items. A refinement of the questions to more specifically tap the variables sought would appear to explain more of the variance. Due to an unforeseen conflict we are not able to proceed to cross validation. Therefore we cannot report on the hypothesis of the efficiency of CCMI, as is, to actually predict academic performance.

TABLE 1

The Kruskal-Wallis one-way analysis of variance* for class averages at mid-semester for students in the full-control, half-control or experimental classes.

FULL-CONTROL		HALF-CONTROL		EXPERIMENTAL	
CLASS AVG.	RANK	CLASS AVG.	RANK	CLASS AVG.	RANK
64.80	19	51.44	1	61.00	13
68.83	30	60.60	12	58.32	6
68.50	28	73.93	38	62.11	15
71.25	34	82.29	50	69.92	31
77.44	45	74.16	41	71.10	33
79.03	47	59.25	10	79.00	46
76.46	44	66.88	24	59.00	9
75.21	43	73.94	39	64.86	20
75.16	42	74.00	40	55.00	3
67.60	25	52.50	2	65.00	21
67.70	26	80.62	49	70.36	31
61.95	14	71.38	35	69.38	29
64.40	18	59.29	11	65.75	23
68.15	27	58.00	5	80.47	48
72.86	37	71.47	36	63.71	17
		65.29	22	58.55	7
				62.67	16
				57.38	4
				58.83	8
ΣRanksFC = 479		ΣRanksHC = 415		ΣRanksEXP = 380	
n = 15		n = 16		n = 19	

$$H = \frac{12}{N(N+1)} \sum_{j=1}^{k} \frac{R_j^2}{n_j} - 3(N+1) = 5.40$$

With an H of 5.40 and k-1 (2) DF's there is no significance (.05)

* For information on the rationale, power and efficiency of the "H" test by Kruskal-Wallis, the reader is referred to S. Siegel: Non-parametric statistics, N.Y.:McGraw-Hill, 1956, pages 184-193.

TABLE 2

The Wilcoxon Matched-Pairs Signed-Ranks* of class averages for the students in the Full-Control group between mid-semester and end of semester.

TEACHER-GROUP:		END OF TERM	MID-TERM	"D"	RANK OF D	SUM D_{lowest}
13	1	66.88	64.80	2.08	7	
	2	69.88	68.83	1.05	3	
	3	68.10	68.50	-0.40	-2	-2
	4	78.38	71.25	7.13	13	
14	1	80.50	77.44	3.06	9	
	2	73.90	79.03	-5.13	-11	-11
15	1	69.54	76.46	-6.92	-12	-12
	2	75.04	75.21	-0.17	-1	-1
	3	76.32	75.16	1.16	4	
	4	70.00	67.60	2.40	8	
	5	69.33	67.70	1.63	5	
16	1	70.64	61.95	8.69	15	
	2	72.92	64.40	8.52	14	
	3	71.47	68.15	3.32	10	
	4	74.86	72.86	2.00	6	

T = 26*

* Not significant at .05 level, with an N = 15 T is significant at 25 or less.

For information on the rationale, power and efficiency of the "T" test by Wilcoxon, the reader is referred to S. Siegel: Non-parametric statistics, N.Y.: McGraw-Hill, 1956, pages 75-83.

TABLE 3

The Wilcoxon Matched-Pairs Signed-Ranks of class averages for the students in the Half-Control group between mid-semester and end of semester.

TEACHER-GROUP		END OF TERM	MID-TERM	"D"	RANK OF D	SUM	D_{lowest} ±
1	1	63.78	51.44	12.34	15		
	4	67.53	60.60	6.93	13		
3	3	73.50	73.93	- 0.43	-1	-1	
	4	81.71	82.29	- 0.58	-2	-2	
4	1	72.08	74.16	- 2.08	-8	-8	
5	1	62.38	59.25	3.13	9		
6	2	75.69	66.88	8.81	14		
	4	75.33	73.94	1.39	4		
7	3	79.60	74.00	5.60	10		
8	1	69.42	52.50	16.92	16		
	3	74.46	80.62	- 6.16	-11	-11	
9	2	69.50	71.38	- 1.88	-7	-7	
10	1	60.88	59.29	1.59	6		
	4	64.55	58.00	6.55	12		
11	2	72.90	71.47	1.43	5		
	3	67.00	65.69	1.31	3		

$T = 29^{*}$

Significant at .05 level, with an N = 16 T is significant at 30 or less.

TABLE 4

Wilcoxon Matched-Pairs Signed-Ranks of class averages for the students in the Experimental group between mid-semester and end of semester.

TEACHER-GROUP		END OF TERM	MID-TERM	"D"	RANK OF D	SUM $D_{lowest\pm}$
1	2	66.09	61.00	5.09	11	
	3	67.32	58.32	9.00	18	
	5	68.11	62.11	6.00	15	
3	1	71.92	69.92	2.00	3	
	2	74.00	71.10	2.90	7	
4	2	75.33	79.00	-3.67	-9	-9
	3	57.44	59.00	-1.56	-1	-1
5	2	70.14	64.86	5.28	13	
6	1	66.35	55.00	11.35	19	
	3	72.00	65.00	7.00	16	
7	1	68.14	70.36	-2.22	-4	-4
	2	66.25	69.38	-3.13	-8	-8
8	2	70.88	65.75	5.13	12	
	4	75.06	80.47	-5.41	-14	-14
9	1	66.00	63.71	2.29	5	
10	2	62.23	58.55	3.68	10	
	3	65.50	62.67	2.83	6	
11	1	66.00	57.38	8.62	17	
	4	60.56	58.83	1.73	2	

T = 36*

*Significant at .01 level, with an N = 19, T is significant at 46 or less.

TABLE 5

The Wilcoxon Matched-Pairs Signed-Ranks of total Community College Motivation Inventory (CCMI) scores for the students in the Half-Control group between mid-semester and end of semester.

TEACHER:	CCMI-B*	CCMI-A*	"D"	RANK OF D	SUM D_{lowest}
1	128.83	126.39	2.44	6	
3	133.71	134.19	-0.48	-3	-3
4	126.00	127.45	-1.45	-5	-5
5	133.00	132.28	0.62	4	
6	134.71	131.09	3.62	8	
7	125.20	117.20	8.00	9	
8	130.20	130.20	0.00		
9	130.57	133.29	-2.72	-7	-7
10	136.91	137.03	-0.12	-1	-1
				T =	-16

With an N = 9, T is significant at 6 or less.

*The Community College Motivation Inventory at the end of the term (CCMI-B) and at mid-semester (CCMI-A).

TABLE 6

The Wilcoxon Matched-Pairs Signed-Ranks of the Self-Enhancement (SE) scores for the students in the Half-Control group between mid-semester and end of semester.

TEACHER:	SE-B*	SE-A*	"D"	RANK OF D	SUM D
1	40.74	40.09	0.65	6	
3	43.00	41.52	1.48	7	
4	43.64	43.18	0.46	4	
5	42.00	44.13	-2.13	-9	-9
6	41.21	41.29	-0.08	-1	-1
7	39.20	37.60	1.60	8	
8	40.84	41.20	0.64	5	
9	37.57	40.00	-2.43	-10	-10
10	41.15	41.35	-0.20	-3	-3
11	41.76	41.89	-0.13	-2	-2
					T = -25

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory scores on the Self-Enhancement scale at the end of the semester (SE-B) and at mid-semester (SE-A).

TABLE 7

The Wilcoxon Matched-Pairs Signed-Ranks of the Intrinsic Motivation (IM) scores for the students in the Half-Control group between mid-semester and end of semester.

TEACHER:	IM-B*	IM-A*	"D"	RANK OF D	SUM D
1	35.74	34.52	1.22	6.5	
3	37.10	37.71	-0.61	-3	-3
4	34.27	33.00	1.27	8	
5	33.88	32.75	1.13	5	
6	38.76	36.32	2.44	10	
7	38.00	36.40	1.60	9	
8	35.24	34.92	0.68	4	
9	38,71	38.86	-0.15	-1	-1
10	36.85	36.50	0.35	2	
11	36.31	35.09	1.22	6.5	
				T =	-4

With an N = 10, T is significant at 8 or less. This T is significant at the .02 level.

*The Community College Motivation Inventory scores on the Intrinsic Motivation scale at the end of the semester (IM-B) and at mid-semester (IM-A).

TABLE 8

The Wilcoxon Matched-Pairs Signed-Ranks of the Person Orientation (PO) scores for the students in the Half-Control group between mid-semester and end of semester.

TEACHER	PO-B*	PO-A*	"D"	RANK OF D	SUM D
1	31.48	30.78	-0.70	-5	
3	31.52	30.71	0.81	7	7
4	30.09	31.09	-1.00	-8	
5	32.00	31.25	0.75	6	6
6	31.79	29.71	2.08	9	9
7	28.00	24.80	3.20	10	10
8	31.44	31.52	-0.08	-1	
9	32,86	33,14	-0.28	-2	
10	34.82	35.44	-0.62	-3	
11	32.22	32.85	-0.63	-4	

T = 32

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory scores on the Person Orientation scale at the end of the semester (PO-B) and at mid-semester (PO-A).

TABLE 9

The Wilcoxon Matched-Pairs Signed-Ranks of the Goal Deficiency (GD) scores for the students in the Half-Control group between mid-semester and end of semester.

TEACHER:	GD-B*	GD-A*	"D"	RANK OF D	SUM D
1	20.87	21.00	-0.13	-2	-2
3	22.10	24.24	-2.14	-8	-8
4	18.00	20.18	-2.18	-9	-9
5	25.13	24.25	0.88	6	
6	22.94	23.76	-0.82	-5	-5
7	20.00	18.40	1.60	7	
8	22.68	22.56	0.12	1	
9	21.43	21.29	0.14	3	
10	24.09	23.74	0.35	4	
11	23.51	23.51	0.00		

T = -24

With N = 9, T is significant at 6 or less.

*The Community College Motivation Inventory scores on the Goal Deficiency scale at the end of the semester (GD-B) and at mid-semester (GD-A).

TABLE 10

The Wilcoxon Matched-Pairs Signed-Ranks of total Community College Motivation Inventory (CCMI) scores for the students in the Experimental group between mid-semester and end of semester.

TEACHER:	CCMI-B*	CCMI-A*	"D"	RANK OF D	SUM D
1	132.12	131.98	0.14	1	
3	138.53	136.84	1.69	5.5	
4	131.64	124.45	7.19	9	
5	136.67	126.50	10.17	10	
6	132.24	131.00	1.26	4	
7	131.46	129.46	2.00	7	
8	128.71	129.42	-0.71	-2	-2
9	132.54	130.85	1.69	5.5	
10	133.19	132.13	1.06	3	
11	131.76	129.70	2.06	8	
				T =	-2

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory at the end of the semester (CCMI-B) and at mid-semester (CCMI-A).

TABLE 11

The Wilcoxon Matched-Pairs Signed-Ranks of the Self-Enhancement (SE) scores for the students in the Experimental group between mid-semester and end of semester.

TEACHER:	SE-B*	SE-A*	"D"	RANK OF D	SUM D
1	42.15	42.90	-0.75	-6	-6
3	41.66	41.63	0.03	1	
4	43.09	41.45	1.64	9	
5	45.17	40.50	4.67	10	
6	40.55	40.71	-0.16	-2.5	-2.5
7	43.58	42.73	0.85	8	
8	41.08	41.88	-0.80	-7	-7
9	41.65	40.92	0.73	5	
10	41.87	41.71	0.16	2.5	
11	40.45	40.15	0.30	4	
				T =	-15.5

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory scores on the Self-Enhancement scale at the end of the semester (SE-B) and at mid-semester (SE-A).

TABLE 12

The Wilcoxon Matched-Pairs Signed-Ranks of the Intrinsic Motivation (IM) scores for the students in the Experimental group between mid-semester and end of semester.

TEACHER:	IM-B*	IM-A*	"D"	RANK OF D	SUM D
1	36.34	35.68	0.66	5	
3	36.41	34.81	1.60	8	
4	36.82	34.36	2.46	9	
5	34.33	29.33	5.00	10	
6	34.13	33.74	0.39	1	
7	35.12	34.54	0.58	4	
8	33.92	33.46	0.46	2.5	
9	33.08	33.54	-0.46	-2.5	-2.5
10	36.52	35.48	1.04	6	
11	37.64	36.36	1.28	7	
				T =	-2.5

With an N = 10, T is significant at 8 or less. This T is significant at the .005 level.

*The Community College Motivation Inventory scores on the Intrinsic Motivation scale at the end of the semester (IM-A) and at mid-semester (IM-A).

TABLE 13

The Wilcoxon Matched-Pairs Signed-Ranks of the Person Orientation (PO) scores for the students in the Experimental group between mid-semester and end of semester.

TEACHER:	PO-B*	PO-A*	"D"	RANK OF D	SUM D
1	29.95	30.20	-0.25	-3	
3	35.22	35.28	-0.06	-1	
4	29.45	29.82	-0.37	-5	
5	28.50	31.17	-2.67	-10	
6	34.00	33.13	0.87	8	8
7	29.35	29.58	-0.23	-2	
8	32.79	32.50	-0.29	-4	
9	34.77	34.00	0.77	7	7
10	33.10	32.10	1.00	9	9
11	32.91	32.52	0.39	6	6
				T =	30

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory scores on the Person Orientation scale at the end of the semester (PO-B) and at mid-semester (PO-A).

TABLE 14

The Wilcoxon Matched-Pairs Signed-Ranks of the Goal Deficiency (GD) scores for the students in the Experimental group between mid-semester and end of semester.

TEACHER:	GD-B*	GD-A*	"D"	RANK OF D	SUM D
1	23.68	23.20	0.48	4	
3	25.25	25.13	0.12	2	
4	22.27	18.82	3.45	10	
5	28.67	25.50	3.17	9	
6	23.58	23.42	0.16	3	
7	23.42	22.62	0.80	6	
8	20.92	21.58	-0.66	-5	-5
9	23.23	22.38	0.85	7	
10	21.71	22.84	-1.13	-8	-8
11	20.76	20.67	0.09	1	
				T =	-13

With an N = 10, T is significant at 8 or less.

*The Community College Motivation Inventory scores on the Goal Deficiency scale at the end of the semester (GD-B) and at mid-semester (GD-A).

TABLE 15

The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students *failing* in the experimental, half-control or full control classes at mid-semester.

EXPERIMENTAL (CATEGORY 1)		HALF-CONTROL (CATEGORY 2)		FULL CONTROL (CATEGORY 3)	
CLASS AVG.	RANK	CLASS AVG.	RANK	CLASS AVG.	RANK
48.89	11	44.50	8	53.13	19
52.75	17.5	———	—	49.50	12
50.00	14	———	—	52.75	17.5
55.00	21	54.83	20	46.43	10
31.58	1	34.13	2		
42.00	7	35.00	3		
45.25	9	40.83	5		
49.83	13	38.00	4		
55.86	22	50.15	15		
41.33	6	52.18	16		
ΣRanksEXP = 116.5		ΣRanksHC = 73.		ΣRanksFC = 58.5	
n = 10		n = 8		n = 4	

H = -0.7254 (with 2 df's there is no significance at 05 level)

TABLE 16

The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students *passing* in the experimental, half-control or full control classes at mid-semester.

EXPERIMENTAL (CATEGORY 1)		HALF-CONTROL (CATEGORY 2)		FULL CONTROL (CATEGORY 3)	
CLASS AVG.	RANK	CLASS AVG.	RANK	CLASS AVG.	RANK
68.83	5	66.23	3	69.44	6
73.64	11	76.71	19	79.11	22
74.14	13	74.55	14	74.84	15
66.80	4	72.50	8	72.80	9.5
75.53	17	76.85	20		
77.00	21	83.75	24		
82.65	23	75.42	16		
73.71	12	76.17	18		
64.82	2	64.52	1		
72.28	7	72.80	9.5		
ΣRanksExp =	115.	ΣRanksHC =	132.5	ΣRanks FC =	52.5
n =	10	n =	10	n =	4

H = 0.3438 (with 2 df's there is no significance at 05 level)

TABLE 17

The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students *failing* in the experimental, half-control or full control classes at the end of the semester.

EXPERIMENTAL (CATEGORY 1)		HALF-CONTROL (CATEGORY 2)		FULL CONTROL (CATEGORY 3)	
CLASS AVG.	RANK	CLASS AVG.	RANK	CLASS AVG.	RANK
51.57	18	46.00	7	46.40	10
51.00	15.5	———	—	34.00	1
51.40	17	51.00	15.5	48.43	12
41.00	3	52.00	20	46.22	9
46.17	8	48.33	11		
52.17	21	44.00	5.5		
50.00	14	———	———		
44.00	5.5	———	———		
40.00	2	51.80	19		
42.33	4	49.40	13		
ΣRanksEXP =	108.	ΣRanksHC =	91.	ΣRanksFC =	32.
n =	10	n =	7	n =	4

H = 52.4273 (with 2 df's this is significant beyond .001 level)

TABLE 18

The Kruskal-Wallis one-way analysis of variance of class averages per teacher for students *passing* in the experimental, half-control or full control classes at the end of the semester.

EXPERIMENTAL (CATEGORY 1)		HALF-CONTROL (CATEGORY 2)		FULL CONTROL (CATEGORY 3)	
CLASS AVG.	RANK	CLASS AVG.	RANK	CLASS AVG.	RANK
69.79	5	72.94	11	71.03	7
75.23	18	76.24	20	81.48	23
73.67	12	73.70	13.5	73.70	13.5
73.80	15	65.83	3	74.87	16
75.92	19	78.13	22		
72.75	10	88.50	24		
77.14	21	72.04	8		
69.64	4	70.57	6		
64.73	2	63.72	1		
75.10	17	72.10	9		
ΣRanksEXP =	123	ΣRanksHC =	117.5	ΣRanksFC =	59.5
n =	10	n =	10	n =	4

H = 0.5718 (with 2 df's there is no significance at .05 level)

TABLE 19

The Wilcoxon Matched-Pairs Signed-Ranks of numbers of students per teacher between mid-semester and end of term for students failing at the end of the semester in the Half-Control group (category 2).

TEACHER:	END OF TERM	MID-TERM	"D"	RANK OF D	SUM D_{lowest}
1	6	10	-4	-3.5	
3	0	0	0		
4	1	0	1	1.5	1.5
5	2	6	-4	-3.5	
6	3	8	-5	-5	
7	1	1	0		
8	0	6	-6	-6.5	
9	0	1	-1	-1.5	
10	5	13	-8	-8	
11	5	11	-6	-6.5	

T = 1.5

Significant at .05 level, with an N = 7 , T is significant at 2 or less.

TABLE 20

The Wilcoxon Matched-Pairs Signed-Ranks of numbers of students per teacher between mid-semester and end of term for students failing at the end of the semester in the Experimental group (Category 1).

TEACHER	END OF TERM	MID-TERM	"D"	RANK OF D	SUM D_{lowest}
1	7	18	-11	-8	
3	2	4	-2	-3.5	
4	5	4	1	1.5	1.5
5	1	1	0		
6	6	12	-6	-7	
7	6	4	2	3.5	3.5
8	3	4	-1	-1.5	
9	2	6	-4	-6	
10	1	14	-13	-9	
11	12	15	-3	-5	

T = 5.0

Significant at .05 level, with an N = 9, T is significant at 6 or less.

TABLE 21

Data for the analysis of variance with three-way classification: student averages for high- and low-Intrinsic Motivation scores for two types of Goal Deficiency under two levels of Self-Enhancement.

	INTRINSIC MOTIVATION				
	HIGH		LOW		
GOAL DEFICIENCY:	HIGH	LOW	HIGH	LOW	
SELF-ENHANCEMENT:					
HIGH:	60	85	60	65	
	73	65	65	76	
	75	79	54	69	
	68	80	62	86	
	85	60	72	71	
	66	67	56	66	
	93	73	63	71	
	83	71	91	74	
	83	88	77	79	
	95	78	64	68	
	68	81	75	73	
	849	827	739	798	3213
LOW:	70	64	65	60	
	81	72	64	53	
	82	74	78	77	
	62	81	77	80	
	75	70	73	62	
	89	84	77	73	
	55	80	83	65	
	68	65	75	63	
	77	72	80	54	
	88	73	60	69	
	31	67	60	77	
	778	802	792	733	3105
		3256		3062	6318

TABLE 22

Analysis of Variance, 3-way classification, fixed effects model for the data of Table 21.

Source of Variation:	DF	Sum of Squares	Mean Squares	F	H_o:
Intrinsic Motivation(IM)	1	427.68	427.68	6.91*	reject
Goal Deficiency(GD)	1	0.0454	0.0454	.007	accept
Self-Enhancement(SE)	1	132.55	132.55	2.14	accept
IM x GD	1	0.0446	0.0446	0.0007	accept
IM x SE	1	80.18	80.18	1.29	accept
GD x SE	1	58.90	58.90	0.95	accept
IM x GD x SE	1	260.65	260.65	4.21**	reject
Students same IM,GD,SE	81	5016.27	61.93		
Total about x...	88	5976.32			

*significant at .01 level
**significant at .05 level

Fisher's Least Significant Difference (LSD)*,a multiple-comparison procedure may now be used to test the significance of difference in population means. We may recall that $LSD_\alpha = t_\alpha (2s^2/r)^{\frac{1}{2}}$; where s^2 is Error Mean Square, t_α is the two-tail t for the Error degrees of freedom and r is sample size.

Intrinsic Motivation: High IM > Low IM (significant at .01 level)
Goal Deficiency: High GD < Low GD (not significant)
Self-Enhancement: High SE > Low SE (significant beyond the .001 level)

* The reader is referred to Fryer,H.C. Concepts and Methods of Experimental Statistics, Boston,Mass.:Allyn & Bacon,1966,259-264.

Conclusions

Conclusions:

The major conclusion of this report is that increasing the professor's awarenss of how students may perceive the meaningfulness of his discipline, and then applying this knowledge to course preparation, directly enhances student intrinsic motivation and indirectly influences student self-enhancement which are significantly related to academic performances. That is, highly significant (99.9%) increases in academic performance of students, especially those who are failure-oriented, in the experimental category versus the half-control category can leave no doubt that the utlilization in classes of rank-ordered preferences of student perceived meaningfulness positively influences academic performance. Thus we may safely and briefly conclude that including "meaningfulness" enhances failure-oriented students to perform to at least criterion. This is in keeping with results obtained previously (Talbot,1980).

Future research will need to more clearly define self-concept as well as to select instruments that can discriminate such factors, one from another. The design of the experiment could be considerably strengthened by the addition of a full-control group that is exposed to instrumentation without treatment effects. That is, students in another full-control group ought to take the MWS and other instruments at the same time and under the same conditions as the experimental group. Probably the most effective technique would be ,independently of teachers, to administer the MWS and have the teachers deliver prepared lectures that would or would not be based on student MWS reports. This would create a double-blind situation, and thus eliminate experimenter bias and the degree of "voluntarism." The obvious

benefit is that the powerful parametric tests could then be used to analyze the data.

In the guise of a general conclusion then it appears that advocates of the self-enhancement theory are intuitively correct. However, establishing that it is possible to effectively measure and to accurately predict the consequences of a higher level of self-enhancement is in need of research.

In summary, the effects of student meanings of work on their self-concept and intrinsic motivation and subsequent academic performance is to directly enhance intrinsic motivation and indirectly to enhance self-concept and that, at this time, enhanced intrinsic motivation leads to better academic performance.

APPENDICES

NOTE ON THE COMMUNITY COLLEGE MOTIVATION INVENTORY AND THE MEANINGFULNESS OF WORK SCALE.

Copyright of the Community College Motivation Inventory (CCMI) as well as the Meaning of Work Scale do not permit us to reproduce here these instruments. The interested reader may order the CCMI from Berkeley Testscor, 284 Purdue Avenue, Berkeley,California. The Meaning and Value of Work Scales as well as correction procedures may be obtained from Dr. H.C. Kazanas,Chairman,Department of Vocational and Technical Education, College of Education, University of Illinois at Urbana-Champaign, Illinois 61801.

The directions given to the students at mid-semester will appear on a separate sheet attached to the cover of the questionnaires. A sample of this follows on the next page.

The directions which will appear on the separate sheet, attached to the questionnaires given to the students at the end of the semester,are presented on page 65.

Champlain Regional College
St-Lawrence Campus
Ste-Foy,P.Q.

Dear Student:

We need information about the way you think and feel about work or study. The results of this questionnaire will be presented to you when we are finished analysing your answers. You should be able to complete this questionnaire easily within an hour.

You are required to answer these questions because you have been chosen as typical Cégep students. We need your honest cooperation to help us eventually help you and future students.

Although you are asked to sign your name on the answer sheet, we assure you that this is only necessary to facilitate entering the data into the computer. You are assured that <u>your scores will be kept confidential</u>.

Please complete all questions and return the materials as you leave. Thank you for your cooperation. We look forward to giving you back your results.

_____

(Professor's name)

Champlain Regional College
St-Lawrence Campus
Ste-Foy, P.Q.

Dear Student;

Now that you have completed your first semester in cégep we would like to have your thoughts and feelings about work or study. These are the same questionnaires as at mid-semester. We would like you to answer them again, as you feel and think right now. Answer spontaneously, make no special effort to remember what you think you may have answered before.

You are assured that your scores will be kept confidential. It shouldn't take you more than an hour to complete this questionnaire..

Please complete all questions and return the materials as you leave. Thank you for your participation.

_____

(Professor's name)

REFERENCES

Ankenbrand, A.S. An investigation of the relationship between achievement and self-concept of high risk community college freshmen. Unpublished doctoral dissertation, St.Louis University, 1971. University Microfilms, Ann Arbor,Michigan Order # 72-5270.

Axelrod, J. "The professor as artist at teaching," New Directions for Higher Education. San Francisco,California: Jossey-Bass, 1973, 17-28.

Bauer, R.D. and Snyder, R. "Ego identity and motivation: An empirical study of achievement and affiliation in Erikson's theory," Psychological Reports, v30 n3, 1972, 951-955.

Borislow, B. "Self evaluation and academic achievement," Journal of Counseling Psychology, 9, 1962, 246-254.

Brookover, W.B. Thomas,S. and Paterson,A. "Self concept of ability and school achievement," Sociology of Education, v37 n3, 1964, 271-278.

Calhoun, J.F. and Acocella, J.R. Psychology of Adjustment and Human Relationships. New York,NewYork: Random House, 1978.

Caughren, H.J. Jr., The Community College Motivation Inventory —— Research Manual. Berkeley Testscor, 284 Purdue Ave, Berkeley,California, 1978.

Centi, P. "Self perception of students and motivation," Catholic Education Research, 63, 1965, 307-319.

Doyon, P. Le profil de maturité de l'étudiant de Cégep. Collège de Maisonneuve, décembre, 1979. Direction générale de l'enseignement collégial (DGEC) # 15-3148.

Duval, M. Personal correspondence, September,1979.

Epstein, S. "The self-concept revisited," American Psychologist, 28, 1973, 405-416.

Erikson, E. Identity, Youth and Crisis. New York, New York: Norton, 1968.

Ferguson, G.A. Statistical Analysis in Psychology and Education. New York, New York: McGraw-Hill, 1971.

Francis, J.B. "Relevance in tertiary instruction: A psychological interpretation," Higher Education, 2, 1973, 325-342.

Fryer, H.C. Concepts and Methods of Experimental Statistics. Boston,Mass.: Allyn and Bacon, 1966.

Grinder, R.E. Adolescence. New York,New York: Wiley, 1973.

Hanson, G. Predictors of Achievement: A Bibliography. State Educational Accountability Repository (SEAR), Department of Public Instruction; 126, Langdon Street, Madison Wisconsin, 53702. (ERIC document # ED 084-629).

Kazanas, H.C. , Baker, G.E., Miller,F.M. and Hannah, L.D. The Meaning and Value of Work. (ERIC document # ED 91504), 1973.

Kazanas, H.C., Hannah, L.D. and Gregor, T.G. "An instrument to measure the meaning and value associated with work," Journal of Industrial Teacher Education, v12 n4, 1975, 68-73.

Kubiniec, C.M. "The relative efficacy of various dimensions of the self concept in predicting academic achievement," American Research Journal, v7 n3, 1970, 321-336.

Langlois, J.-P. Les Perceptions de Soi en Relation avec le Succès et l'Insuccès Scolaire. Unpublished Master's Thesis, University of Sherbrooke, 1975.

Marecek, J. and Mettee, D.R. "Avoidances of continued success as a function of self esteem, level of self esteem certainty and responsibility for success," Journal of Personality and Social Psychology,v22 n1, 1972, 98-107.

Mead, G.H. Mind, Self and Society. Chicago,Illinois: Univ. Chicago Press,1934.

Ministère de l'Education du Québec (MEQ) Colleges in Québec, 1978.

Moore, W. Jr., "The use of motivation and self concept tests in community colleges: A survey," Mimeographed, Columbus,Ohio: The Ohio State Univ., School of Education, 1975. Cited in Moore, 1976.

Moore, W. Jr., "Community college response to the high-risk student: A critical reappraisal," American Association of Community and Junior Colleges, One Dupont Circle, N.W., Washington,D.C. 20036 1976 (ERIC document ED 122-873).

Muuss, R.E. Theories of Adolescence. New York,New York: Random House,1975.

Newman,P.R. and Newman, B.M. Development Through Life.Homewood,Illinois: Dorsey Press, 1975.

Nichols, I.A. and Shauffer, C.B. "Self concept as a predictor of performance in college women," Paper presented at the Annual Convention of the American Psychological Association (83rd, Washington,D.C., March 22-23,1975) (ERIC document # ED 124-865).

Nie, H.H., Hull, C.H., Jenkins, J.G., Steinbrenner,K. and Bent, D.H. Statistical Package for the Social Sciences —— SPSS. New York,N.Y.:McGraw-Hill,1975.

Parker, J. "The relationship of self report to inferred self concept," Educational and Psychological Measurements, 26, 1966, 691-700.

Purkey, W.W. Self Concept and School Achievement. New Jersey: Prentice-Hall, 1970.

Ralph, N. "Stages of Faculty Development," New Directions for Higher Education, San Francisco,California: Jossey-Bass, 1973, 61-68.

Roueche, J.E. and Kirk, R.W. Catching Up: Remedial Education. San Francisco, California: Jossey-Bass, 1973

Schaar, Wm. G. Jr., Changes in academic success and self concept of low achieving community college freshmen. Unpublished doctoral dissertation, Michigan State University, 1966. University Microfilms, Ann Arbor,Michigan Order # 67-1677).

Simon, J. Basic Research Methods in Social Science. New York,N.Y.:Random House, 1978.

Stark, P.A. and Traxler, A.J. "Empirical validation of Erikson's theory of identity crises in late adolescence," Journal of Psychology, v86 n1, 1974, 25-33.

Talbot, G.L. The Effects of Student Meanings and Values of Work on Intrinsic Motivation and Subsequent Academic Performance. In press,1980.

Talbot, G.L. "Enhancing the performance of students failing to perform to criterion,"Journal of the Association of Canadian Community Colleges, vol IV n 3/4, 1980, 59-70.

Wylie, R. The Self-Concept: A Review of Methodological Considerations and Measuring Instruments. Lincoln, Nebraska: University of Nebraska,1974.